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Inventor :—JOHN JACKSON.



Date of filing Complete Specification : May 16, 1952.

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Complete Specification Published : June 29, 1955.

Index at Acceptance :—Class 125(2), E2A.

COMPLETE SPECIFICATION.

Improvements in Automatic Capping Machines for Receptacles.

We, G. D. PETERS & COMPANY LIMITED, a Body Corporate, duly organised under the Laws of Great Britain, of Windsor Works, Slough, in the County of Buckingham, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement :—

This invention relates to automatic capping machines for applying and tightening the screw-on caps or lids of bottles, jars and similar receptacles having screw necks, and has more especial reference to machines such as are described in the Specification of co-pending Application No. 16893/50 (Serial No. 732,658) where the caps are presented one to each bottle or jar as it starts its path along the capping conveyor, each cap having the front edge of its rim depressed so that it is picked up by the neck of the bottle or jar as the latter passes under the cap feed delivery chute.

Although normally effective, such automatic capping machines have hitherto not been able automatically to straighten and tighten, i.e. screw up caps which have been picked off from the chute in such manner that their threads are crossed with those on the neck of the bottle, jar or other container, and the present invention has for its object to remedy the deficiency and provide a cross-thread rectifying or cap trimming attachment for capping machines which ensures that the caps on the containers reaching the tightening section are ready for screwing home.

In accordance with the present invention, a cross-thread rectifying or cap trimming attachment for automatic capping machines, includes a sensing member adapted to be moved by any cap picked off the delivery chute by a container on the capping conveyor with the cap and neck threads crossed, such

movement tripping a friction brake which then bears on the cap to re-set it ready for tightening.

The invention will be further described with reference to the accompanying drawings which illustrate a preferred form of cross-thread rectifying attachment intended more particularly for the automatic capping machine forming the subject of the aforementioned Patent Specification Serial No. 732,658 (co-pending Application No. 16893/50) and in which drawings :—

Fig. 1 is a front perspective view of the capping machine in question ; while

Figs. 2, 3 and 4 are views to a larger scale of the rectifying attachment, Fig. 2 being a cross-section looking from the rear, Fig. 3 a plan and Fig. 4 a side view.

Referring now to the drawings, but first more particularly to Fig. 1 the capping machine there illustrated has a generally rectangular metal casing 1 with a flat table top 2 longitudinally slotted at 3 to take a slat type capping conveyor 4 which passes the bottles 5 or other receptacles to be capped, under the foot of a cap feed chute 6 where each picks up a cap 7, through a cross-thread rectifying station hereafter described with reference to Figs. 2 to 4, and thence through a cap tightening station between three pairs of rubber faced tightening rollers 10, to the front of the machine as viewed in Fig. 1.

During their passage along the capping conveyor 4, the bottles 5 are held against rotation by side conveyor belts 11, 12 on one side and 13, 14 on the other, moving at the same linear speed on pulleys 15, 16 and 17, 18 as the capping conveyor 4 and pressed against the line of bottles by vertical supporting rollers 19 and 20, all as in the aforementioned Specification.

Also as in the aforementioned Specification a rubber faced rail may be located between the bottom of the chute 6 where the caps are

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picked off for initially screwing up the caps before they pass to the tightening rollers and where such a preliminary screwing up device is furnished, the cross-thread rectifying attachment now to be described with reference to Figs. 2 to 4 will be located between the bottom of the chute 6 and such rubber faced rail.

Referring then to Figs. 2 to 4, 50 is a sensing finger located in the path of the caps 7 on the bottles 5 between the bottom of the chute 6 and the screwing up station and this finger is moved by any cross-threaded cap 7, that is, one which stands proud of its bottle to trip a brake mechanism which brings rubber retarding surface 51 into frictional engagement with the side of the cap 7 causing it initially to unscrew as its bottle 5 proceeds towards the screwing-up station, so that the cap 7 is reset before it reaches the screwing-up station, where it is screwed up and tightened by the rollers 10.

The brake mechanism includes a sliding support 52 for the rubber retarding surface 51 which is urged towards the path of the caps by a coil spring 53 and which is allowed to move inwardly under the influence of such spring when tripped by the sensing finger 50 being moved upwardly by a proud cap.

As will be seen more clearly in Fig. 3 the sensing finger 50 carries a trip arm 54 which in the position shown forms a stop preventing the inward movement of a yoke-shaped abutment 55 bolted to the slide 52, but when the sensing finger is raised by a proud cap and lifts with it the abutment stop 54, the rubber retarding surface 51 is permitted to move inwards and unscrews the cap in question as it passes forwardly on its bottle along the conveyor.

A projection 56 at the trailing edge of the friction brake 51 moves back the slide 52 to reset the device and avoid interference with the future passage of caps which have been correctly picked up by the device until the sensor is again actuated by a cross-threaded cap to release the trip mechanism constituted by the stop 54 and movable abutment 55.

57 is an adjustable steel guide rail disposed symmetrically to the friction brake 51 but on the opposite side of the cap path.

By the present invention a cross-thread rectifying or cap trimming attachment for

automatic capping machine is provided by the inclusion of which the output of the machine is greatly enhanced and the caps automatically and regularly screwed on to their containers with a substantially uniform degree of tightness.

What we claim is :—

(1) A cross-thread rectifying or cap trimming attachment for capping machines for receptacles of the kind including a conveyor upon which the caps on the receptacles are passed to a capping station, including a sensing member adapted to be moved by any cap with its screw-thread crossed in relation to that of its receptacle, such movement tripping a friction brake which then bears on the cap to reset it ready for tightening.

(2) A cross-thread rectifying or cap trimming attachment for a machine for applying and tightening screw-on caps to receptacles, as they pass on a conveyor to a tightening station, including a sensing finger located in advance of the tightening station and moved by cross-threaded, i.e. proud, caps to trip a brake mechanism which brings a rubber retarding surface into frictional engagement with the side of the cap as it is moved forwardly on the receptacle by the conveyor to the tightening station, this frictional engagement having the effect of initial unscrewing the cap and enabling it to reset.

(3) A cross-thread rectifying or cap trimming attachment according to the preceding Claim 2, including the provision at the trailing end of the friction surface of a catch which moves the parts of the trip mechanism back to their initial position so as not to interfere with the future passage of caps which have been correctly picked up by the receptacles, that is until the sensor of the trip mechanism is again actuated by a cross-threaded cap.

(4) A cross-thread rectifying or cap trimming attachment for capping machines for receptacles constructed and adapted to operate substantially as described with reference to the accompanying drawings.

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PROVISIONAL SPECIFICATION.

Improvements in Automatic Capping Machines for Receptacles.

We, G. D. PETERS & COMPANY LIMITED, a Body Corporate, duly organised under the Laws of Great Britain, of Windsor Works, Slough, in the County of Buckingham, do

hereby declare this invention to be described in the following statement :—

This invention relates to automatic capping machines for applying and tightening the

screw-on caps or lids of bottles, jars and similar receptacles having screw necks, and has more especial reference to machines such as are described in the Specification of pending Application No. 16893/50 where the caps are presented one to each bottle or jar as it starts its path along the capping conveyor, each cap having the front edge of its rim depressed so that it is picked up by the neck of the bottle or jar as the latter passes under the cap feed delivery chute.

Although normally effective, such automatic capping machines have hitherto not been able automatically to straighten and tighten, i.e. screw up caps which have been picked off from the chute in such manner that their threads are crossed with those on the neck of the bottle, jar or other container, and the present invention has for its object to remedy the deficiency and provide a cross-thread rectifying or cap trimming attachment for capping machines which ensures that the caps on the containers reaching the tightening section are ready for screwing home.

In accordance with the present invention, a cross-thread rectifying or cap trimming attachment for automatic capping machines, includes a sensing member adapted to be moved by any cap picked off the delivery chute by a container on the capping conveyor with the cap and neck threads crossed, such movement tripping a friction brake which then bears on the cap to re-set it ready for tightening.

Preferably the sensing member is a pivoted trip arm member which is cleared by properly picked off caps but is in the path of any caps which may be "proud," and is moved by them to release a spring urged friction brake suitably a rubber track which moves to a position where it bears on the peripheral wall of the cap as it progresses along the capping conveyor and turns it in a counter clockwise direction relative to the neck of its container to reset it ready for screwing home. As the cap passes the end of the rectifying attachment, it re-sets the trip mechanism so that there is no interference with following caps which have been properly picked off by their companion receptacles.

In the practice of the invention applied to an automatic capping machine as described in the aforementioned Specification, the cap trimming attachment is sited above the capping conveyor where the bottle with its picked cap reaches the two pairs of spring

loaded rubber belts by which rotation of the bottle is prevented and before the cap makes contact with a rubber lined strip which is to effect initial tightening.

The pivoted trip arm is cranked or inclined slightly upwardly in the direction along which the caps approach the tightening rolls from the cap delivery chute, its height being adjustable to suit different dimensions of cap and/or bottle, and it being pivotally mounted on an adjustable cross member bridging the machine above the passageway along which the bottles are moved by the capping conveyor as they pass through the capping section.

Carried by the pivoted trip arm is a traverse stop member which may also be adjustable and which normally prevents inward movement of a spring urged traverse carrying the friction brake suitably a steel track having its surface adjacent the cap passageway lined with rubber.

The friction brake traverse is carried in a slideway provided for the purpose on the machine bed, and a tension spring is operative when the mechanism is released by the trip member to move the friction surface inwardly into the path of the cap to an extent predetermined by adjustment.

As aforementioned, the friction brake also includes an abutment at the end of the rectifying attachment which moves the friction brake traverse outwardly to its normal position and re-sets the trip mechanism so as to avoid interference with following properly picked up caps.

Symmetrically disposed on the opposite side of the cap path to the friction brake may be positioned a steel guide rail and, preferably, both friction brake and guide rail have a wide range of adjustment to suit the machine to different sizes of cap and/or receptacle.

By the present invention a cross-thread rectifying or cap trimming attachment for automatic capping machines is provided by the inclusion of which the output of the machine is greatly enhanced and the caps automatically and regularly screwed on to their containers with a substantially uniform degree of tightness.

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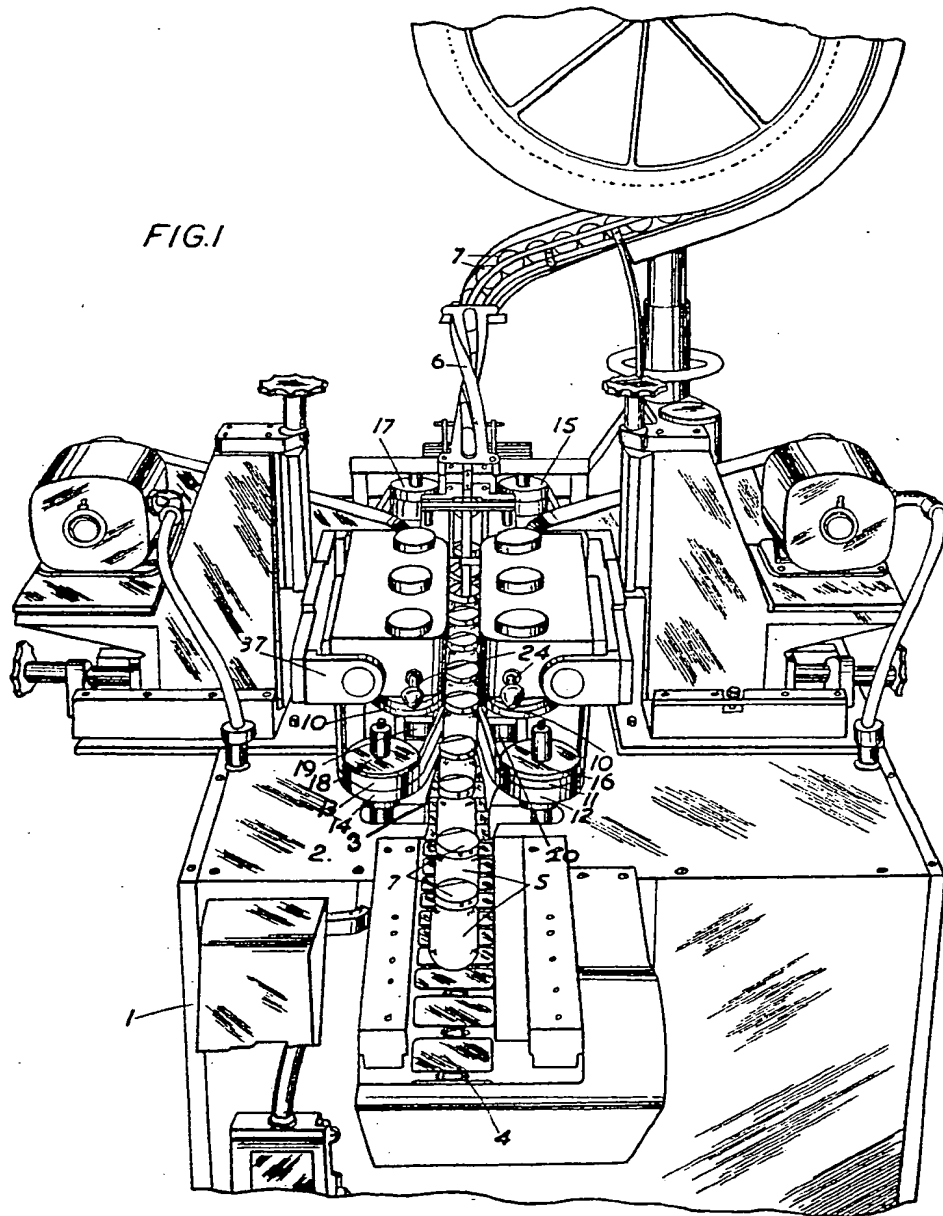
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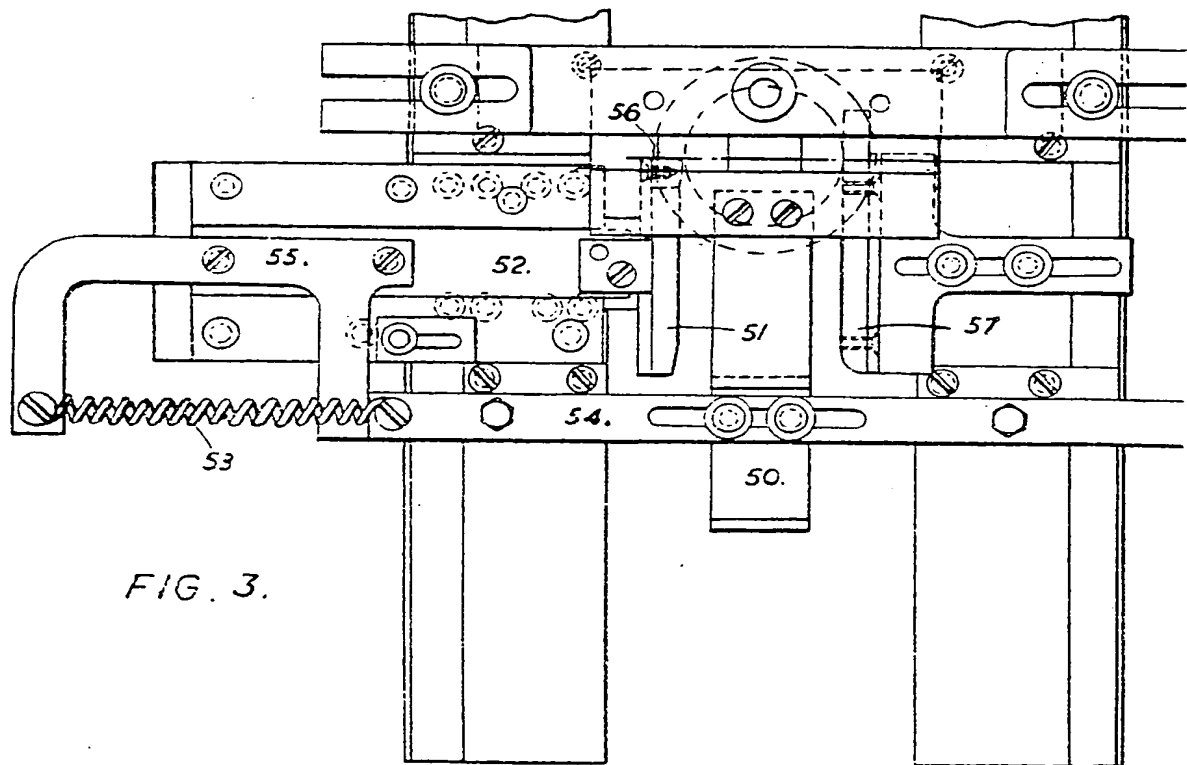
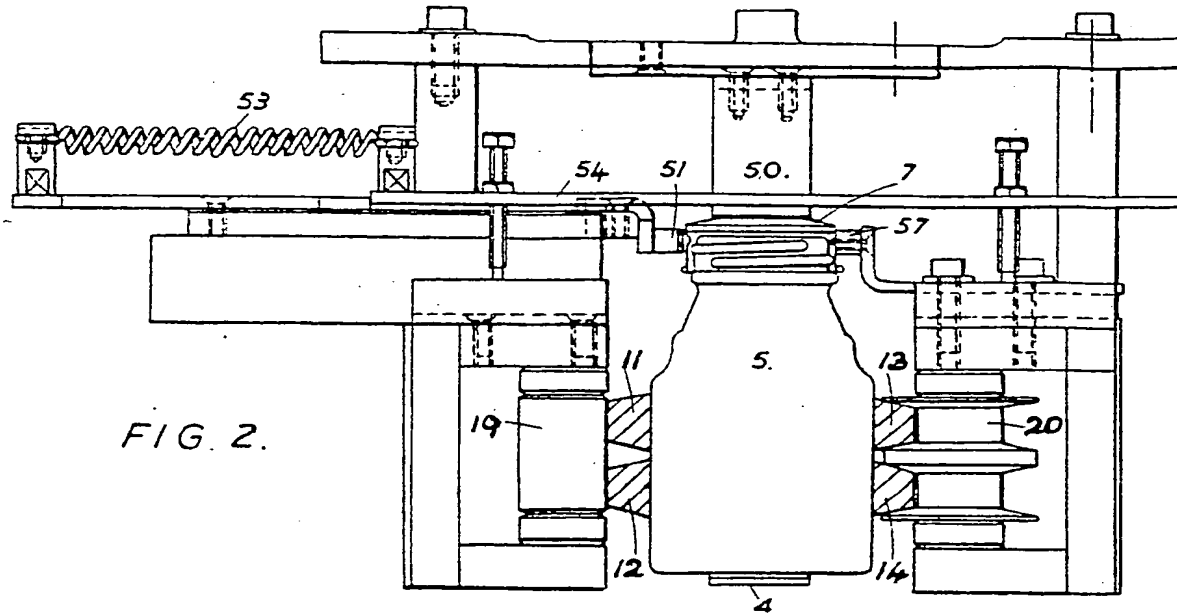
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SHEET 1

FIG. 1





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 SHEET 2

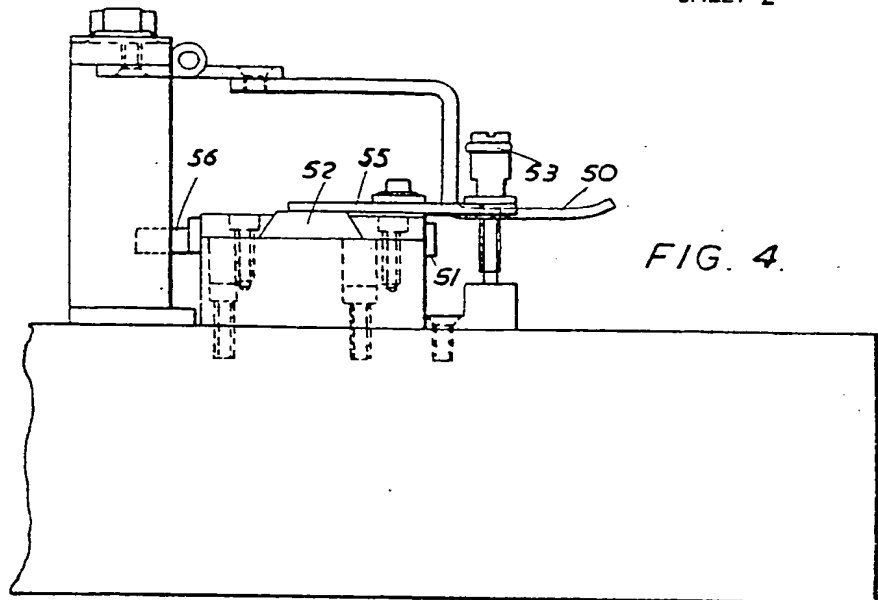
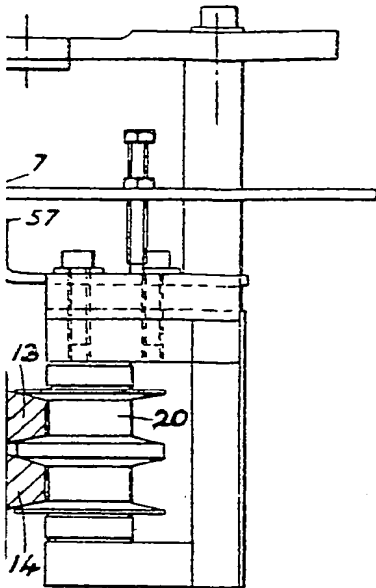


FIG. 4.

